## *AMENDMENTS TO THE CLAIMS*

***Please amend the claims as follows:***

1. (Currently Amended) An exposure apparatus which exposes a substrate through a pattern of an original plate, comprising:

a stage configured to move the substrate;

a chuck provided on the stage and configured to hold the substrate;

a piping made of resin and connected to the stage;

means for feeding into the piping liquid or gas to cool the stage; and

a heating mechanism configured to heat the chuck so that the temperature of the substrate is higher by at least 5 °C than the temperature of the liquid or gas, ~~having a predetermined temperature,~~

wherein the ~~predetermined~~ temperature of the liquid or gas is set to be between 5 °C and 18 °C.

2. (Canceled)

3. (Canceled)

4. (Canceled)

5. (Canceled)

6. (Currently Amended) An exposure apparatus according to Claim 1, further comprising ~~a stage for moving a substrate; and~~ a chamber enclosing the stage,

wherein the predetermined temperature of the liquid or gas is lower than the temperature of an inner-wall of the chamber.

7. (Canceled)

8. (Canceled)

9. (Previously Presented) An exposure apparatus according to Claim 1, wherein the piping contains a first pipe through which a first fluid flows, and a second pipe through which a second fluid flows.

10. (Canceled)

11. (Original) An exposure apparatus according to Claim 9, wherein the piping is formed in such a manner that the second pipe encloses the first pipe.

12. (Currently Amended) An exposure apparatus according to Claim [[10]] 11, wherein the temperature of the first fluid is lower than the temperature of the second fluid.

13. (Canceled)

14. (Currently) An exposure apparatus according to Claim [[9]] 11, wherein the temperature of the second fluid is lower than the temperature of the substrate.

15. (Canceled)

16. (Canceled)

17. (Currently Amended) An exposure apparatus according to Claim [[6]] 1, wherein the heating mechanism contains a Peltier device.

18. (Canceled)

19. (Original) An exposure apparatus according to Claim 6, wherein the inside of the chamber is kept in a vacuum state.

20. (Currently Amended) A method of producing a semiconductor device ~~fabricating method comprising the steps of: exposing a substrate by means of using an exposure apparatus according to Claim 1; and developing the exposed substrate~~ utilizing an exposure apparatus which is configured to expose a substrate through a pattern of an original plate, the exposure apparatus comprising a stage configured to move the substrate; a chuck provided on the stage and configured to hold the substrate; a piping made of resin and connected to the stage; a means for feeding into the piping liquid or gas to cool the stage; and a heating mechanism configured to heat the chuck so that the temperature of the substrate is higher by at least 5 °C than the temperature of the liquid or gas, wherein the temperature of the liquid or gas is set to be between 5 °C and 18 °C, the method comprising:

exposing the substrate utilizing the exposure apparatus; and

developing the exposed substrate.

21. (Canceled)

22. (Canceled)

23. (New) A method for reducing out-gassing from flexible resin tubes utilized inside a vacuum chamber which is part of an exposure apparatus for manufacturing semiconductor devices, the method performed for the purpose of reducing the formation of unwanted material deposits onto optical elements contained within the chamber; the exposure apparatus including a chamber unit enclosing at least one of a wafer stage unit, a reticle stage unit, and a projection optical system, thereby allowing at least one of a vacuum to be formed within the chamber or an inert gas to be filled within the chamber, the exposure apparatus further including a circulating apparatus configured to circulate a coolant via the flexible resin tubes through at least one of the wafer stage, reticle stage and projection optical system for controlling temperatures of the same; the method comprising:

maintaining a temperature of the coolant at about 10° C lower than the lowest of either a first temperature taken proximate the inner wall surface or a second temperature of the wafer,

whereby out-gassing from the resin tubes is reduced by maintaining the temperature of the coolant at about 10° C lower than the lowest of either the first and second temperatures.

24. (New) The method according to Claim 23, wherein the coolant comprises circulated water maintained between 5° C and 18° C by the circulating apparatus, thereby, preventing stiffening of the flexible resin tubes due to freezing and the formation of condensation.

25. (New) The method according to Claim 23, wherein the flexible resin tubes are composed of urethane resin.

26. (New) The method according to Claim 23, wherein the wafer stage unit includes a wafer stage platen and a wafer stage adapted to slidably move on a surface of the wafer stage platen, and the wafer stage further includes an upper surface adapted to receive a wafer.

27. (New) The method according to Claim 23, wherein the reticle stage unit includes a reticle stage support, a reticle stage adapted to slidably move on a surface of the reticle stage support, and a reticle positioned on a lower surface of the reticle stage.

28. (New) The method according to Claim 23, wherein the apparatus further includes gas-bearings utilized in the wafer stage unit to provide a slidable interface between the wafer stage platen and the wafer stage, and a gas supply configured to supply gas via flexible resin gas tubes to the wafer stage unit;

the method further comprising:

maintaining a temperature of the gas at about 10° C lower than the lowest of either the first and second temperatures,

whereby out-gassing from the resin gas tubes is reduced by maintaining the temperature of the gas at about 10° C lower than the lowest the first and second temperatures.

29. (New) The method according to Claim 23, the apparatus further including gas-bearings utilized in the reticle stage unit to provide a slidable interface between the reticle stage support and the reticle stage, and a gas supply configured to supply gas via flexible resin gas tubes to the reticle stage unit; the method further comprising:

maintaining a temperature of the gas at about 10° C lower than the lowest of either the first and second temperatures,

whereby out-gassing from the resin gas tubes is reduced by maintaining the temperature of the gas at about 10° C lower than the lowest of either the first and second temperatures.

30. (New) The method according to Claim 26, wherein the wafer stage unit further includes a peltier device positioned on top of the wafer stage, a seat positioned on top of the peltier device, a wafer chuck and a wafer positional reference system positioned on top of the seat, and a peltier device controller unit configured to control the peltier device; the method further comprising:

calculating a difference between temperatures of the wafer stage and the seat; and

applying a voltage to the peltier device to maintain a target temperature at the wafer,

whereby maintaining a target temperature at the wafer prevents a change in position between the wafer and the wafer positional reference system.

31. (New) The method according to Claim 26, wherein the wafer stage unit further includes a heater device positioned on top of the wafer stage, a seat positioned on top of the heater device, a wafer chuck and a wafer positional reference system positioned on top of the seat, and a heater device controller unit configured to control the heater device; the method further comprising:

calculating a difference between temperatures of the wafer stage and the seat; and

controlling the heater device to maintain a target temperature at the wafer,

whereby maintaining a target temperature at the wafer prevents a change in position between the wafer and the wafer positional reference system.

32. (New) The method according to Claim 26, wherein the wafer stage unit further includes a driving system including a driver circuit, a plurality of cables having resin connectors in communication with the driver circuit and the wafer stage for feeding signals to the wafer stage, a resin connecter connected to a feed-through of the chamber, a resin power supply cable routed through the feed-through and configured to supply power to the driver circuit; and metallic piping wrapped around the resin connectors, the resin power supply cable and the driver circuit, wherein coolant is circulated through the metallic piping; the method further comprising:

lowering and maintaining the temperature of the driver system at a target temperature;

whereby out-gassing from the resin connectors, the resin power supply cable and the driver circuit is reduced by lowering and maintaining the temperature of the driver system at the target temperature.

33. (New) The method according to Claim 32, wherein the target temperature is about 15° C.

34. (New) The method according to Claim 23, wherein the flexible resin tubes comprises a double structure having an inner tube and an outer tube concentrically formed around the inner tube; the method further including:

circulating a second coolant to at least one of the wafer stage, reticle stage and projection optical system for controlling temperatures of the same via the inner tube; and

circulating the coolant via the outer tube whereby out-gassing from the resin tubes is reduced by maintaining the temperature of the coolant at about 10° C lower than the lowest of either the first and second temperatures.

35. (New) The method according to Claim 34, the method further comprising maintaining the temperature of the second coolant in the inner tube higher than the temperature of the coolant in the outer tube.

36. (New) The method according to Claim 34, wherein one of the coolant and second coolant is gas and the other is liquid.

37. (New) An exposure apparatus for manufacturing semiconductor devices, the apparatus having an out-gassing reduction system for reducing out-gassing from flexible resin tubes utilized inside a vacuum chamber which is part of the exposure apparatus, the out-gassing system integrated therein the exposure apparatus for the purpose of reducing the formation of unwanted material deposits onto optical elements contained within the chamber; the exposure apparatus comprising:

a chamber unit enclosing at least one of a wafer stage unit, a reticle stage unit, and a projection optical system, thereby allowing at least one of a vacuum to be formed within the chamber and an inert gas to be filled within the chamber; and

a circulating apparatus configured to circulate a coolant via the flexible resin tubes through at least one of the wafer stage, reticle stage and projection optical system for controlling temperatures of the same,

wherein a temperature of the coolant is maintained at about 10° C lower than the lowest of either a first temperature taken proximate the inner wall surface or a second temperature of the wafer,

whereby out-gassing from the resin tubes is reduced by maintaining the temperature of the coolant at about 10° C lower than the lowest of either the first and second temperatures.

38. (New) The exposure apparatus according to Claim 37, wherein the coolant comprises circulated water maintained between 5° C and 18° C by the circulating apparatus, thereby, preventing stiffening of the flexible resin tubes due to freezing and the formation of condensation.

39. (New) The exposure apparatus according to Claim 37, wherein the flexible resin tubes are composed of urethane resin.

40. (New) The exposure apparatus according to Claim 37, wherein the wafer stage unit includes a wafer stage platen and a wafer stage adapted to slidably move on a surface of the wafer stage platen, and the wafer stage further includes an upper surface adapted to receive a wafer.

41. (New) The exposure apparatus according to Claim 37, wherein the reticle stage unit includes a reticle stage support, a reticle stage adapted to slidably move on a surface of the reticle stage support, and a reticle positioned on a lower surface of the reticle stage.

42. (New) The exposure apparatus according to Claim 37, wherein the exposure apparatus further includes gas-bearings utilized in the wafer stage unit to provide a slidable interface between the wafer stage platen and the wafer stage, and a gas supply configured to supply gas via flexible resin gas tubes to the wafer stage unit;

wherein a temperature of the gas is maintained at about 10° C lower than the lowest of either the first and second temperatures,

whereby out-gassing from the resin gas tubes is reduced by maintaining the temperature of the gas at about 10° C lower than the lowest of either the first and second temperatures.

43. (New) The exposure apparatus according to Claim 37, wherein the exposure apparatus further includes gas-bearings utilized in the reticle stage unit to provide a slidable interface between the reticle stage support and the reticle stage, and a gas supply configured to supply gas via flexible resin gas tubes to the reticle stage unit;

wherein a temperature of the gas is maintained at about 10° C lower than the lowest of either the first and second temperatures,

whereby out-gassing from the resin gas tubes is reduced by maintaining the temperature of the gas at about 10° C lower than the lowest of either the first and second temperatures.

44. (New) The exposure apparatus according to Claim 40, wherein the wafer stage unit further includes a peltier device positioned on top of the wafer stage, a seat positioned on top of the peltier device, a wafer chuck and a wafer positional reference system positioned on top of the seat, and a peltier device controller unit configured to control the peltier device by applying a voltage to the peltier device to maintain a target temperature at the wafer;

wherein a temperature of the wafer stage and a temperature of the seat is obtained and a difference between the temperatures of the wafer stage and the seat is calculated,

whereby maintaining a target temperature at the wafer prevents a change in position between the wafer and the wafer positional reference system.

45. (New) The exposure apparatus according to Claim 40, wherein the wafer stage unit further includes a heater device positioned on top of the wafer stage, a seat positioned on top of the heater device, a wafer chuck and a wafer positional reference system positioned on top of the seat, and a heater device controller unit configured to control the heater device;

wherein a temperature of the wafer stage and a temperature of the seat is obtained and a difference between the temperatures of the wafer stage and the seat is calculated,

whereby maintaining a target temperature at the wafer prevents a change in position between the wafer and the wafer positional reference system.

46. (New) The exposure apparatus according to Claim 40, wherein the wafer stage unit further includes a driving system including a driver circuit, a plurality of cables having resin connectors in communication with the driver circuit and the wafer stage for feeding signals to the wafer stage, a resin connecter connected to a feed-through of the chamber, a resin power supply cable routed through the feed-through and configured to supply power to the driver circuit; and metallic piping wrapped around the resin

connectors, the resin power supply cable and the driver circuit, wherein coolant is circulated through the metallic piping;

wherein the temperature of the driver system is lowered and maintained at a target temperature;

whereby out-gassing from the resin connectors, the resin power supply cable and the driver circuit is reduced by lowering and maintaining the temperature of the driver system at the target temperature.

47. (New) The exposure apparatus according to Claim 46, wherein the target temperature is about 15° C.

48. (New) The exposure apparatus according to Claim 37, the flexible resin tubes further comprising a double structure having an inner tube and an outer tube concentrically formed around the inner tube,

wherein a second coolant is circulated to at least one of the wafer stage, reticle stage and projection optical system for controlling temperatures of the same via the inner tube, and

wherein the coolant is circulated via the outer tube whereby out-gassing from the resin tubes is reduced by maintaining the temperature of the coolant at about 10° C lower than the lowest of either the first and second temperatures.

49. (New) The exposure apparatus according to Claim 48, wherein the temperature of the second coolant in the inner tube is maintained higher than the temperature of the coolant in the outer tube.

50. (New) The exposure apparatus according to Claim 48, wherein one of the coolant and second coolant is gas and the other is liquid.

51. (New) The exposure apparatus according to Claim 37, further comprising

an inner wall temperature sensor configured to obtain a temperature at an inner wall surface of the chamber unit; and

a wafer temperature sensor configured obtain a temperature at a surface of the wafer.